

# The Resource

*for Environmental Education in Missouri*

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Photo by Jim Rathart

## Go Outside and Learn!

*by Jeff Cantrell and Pat Whalen*  
*Conservation Education Consultants*

Many of us remember our parents or grandparents telling us to "GO OUTSIDE AND PLAY." However, they may not have realized that outdoor experiences provided us with rich educational opportunities. Good old-fashioned outdoor play is connected to a learning method used in schools throughout the nation – the outdoor classroom.

What is an outdoor classroom? It's any area outside your school building that is effectively used by students and teachers as a place for learning. Every school has an outdoor classroom, but every classroom is different. Your outdoor classroom might include one tree or several forested acres. It might contain puddles on the playground or a thriving wetland. It might feature a paved sidewalk to the parking lot or a wood-chipped trail across a prairie. Right outside your door is a valuable resource that can provide a unique learning experience to you and your students.

The key to success in an outdoor classroom is to plan big, but start small. Consider this three-step approach. First, get out and **use** what's already there. Next, work to **enhance** the site. Remove trash, hang bird-feeders, clean up poison ivy, label trees and more. While using the enhanced site, create a long range plan for **developing** your site to capitalize on existing features that you discover during regular use of the site.

Outdoor classrooms naturally provide benefits for students. Students enjoy being in outdoor settings and are often more motivated to learn. Outdoor classrooms provide opportunities for a variety of learning styles. For instance, some students learn best by listening, some by seeing, some by touching and smelling and others when they have the opportunity to do something hands-on. As students take an interest in discovering and creating their own outdoor "habitat," many develop a long-term interest in caring for the environment. Maybe most importantly, students can connect what they learn in the outdoor classroom with the world beyond the classroom. This helps develop better citizens, and better citizens make a better community.

With all these benefits for using the outdoors as a classroom, why do teachers sometimes hesitate? Often, teachers are reluctant to use the outside because they feel they are not experts on the natural environment. If you have this concern, remember that you don't need to know everything

### *What's in it for you?*

- ◆ Visit a real, live outdoor classroom, pages 2-3
- ◆ Need advice? page 4
- ◆ Don't let money slow you down pages 4-5
- ◆ Show-Me State Garden page 6
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**An Entire Issue Devoted  
to Outdoor Classrooms!**

*continued on page 6...*

# Seeing is Believing:

## Learn about Outdoor Classrooms from the Pros!

Would you like to visit an existing outdoor classroom? Consider contacting these schools to ask questions or arrange a visit. Invite several teachers from your school - it's the perfect excuse for a road trip! Each contact person is willing to talk with you about their outdoor classroom experience. While these sites are scattered throughout the state, this is only a small number of the many great outdoor classrooms found in Missouri. To locate one specific to your needs, contact your Conservation Education Consultant (page C-8).



### **Bernie R-8**

*Robin Ritchie (Principal), 516 West Main, Bernie, Missouri 63822, Stoddard County, 573/293-5335, <[ritchier@bernie.k12.mo.us](mailto:ritchier@bernie.k12.mo.us)>*

Wide variety of stations including a pond, tree farm, vegetable garden, trail, wind break and SO much more. A sundial uses the shadow of a standing student to tell time. Students simply need to stand in the right place to tell time, helping them study solar movement and history.



### **Central Elementary School**

*Cheryl Chapman (1st Grade) and Laura Faenger (Kindergarten), 400 Gibbs, P.O. Box E, Pierce City, MO, 65723-0305, Lawrence County, 417/476-2255*

Features a user-friendly set-up with gardens for different grades, a butterfly garden, gazebo, wildlife shelters, weather monitoring site and wetland. The school's "back 40" can easily lend itself to cross-curricular activities such as Monarchs in the Classroom, Project FeederWatch and Project WET, WILD and Learning Tree.



### **Fleetridge Elementary School**

*Shirley Keisker (2nd Grade), 13001 E. 55th St., Kansas City, MO 64133-3101, Jackson County, 816/737-6255, <[shirley.keisker@mail.raytown.k12.mo.us](mailto:shirley.keisker@mail.raytown.k12.mo.us)>*

Boasts an established nature trail, butterfly garden and amphitheater in a wooded area on school property. A well planned and designed curriculum guide/activity book assists teachers using this outdoor classroom.



### **Hamilton R-2**

*Rosemary Lucas (7th and 8th grades), Highway 13 South, P.O. Box 128, Hamilton, MO 64644, Caldwell County, 816/583-2173, <[lucas@hamilton.k12.mo.us](mailto:lucas@hamilton.k12.mo.us)>*

Students, staff and community have worked together to create and maintain an outdoor area with two amphitheaters, a grass trail through a mostly open prairie habitat and a bridge over a creek. A native prairie grass and wildflower plot has been started and an old pond converted into a marsh/wetland habitat.



### **Harrisburg R-VIII**

*Jill Williamson (1st Grade), 221 South Harris, Harrisburg, MO 65256, Boone County, 573/875-0290*

Developed over several years and features a wide variety of habitat types including a wetland, pond, prairie and woodland stream. Don't miss the amphitheater, garden, kid-size chess board, geology station, viewing deck, cemetery and backyard deck. Special plantings, a concrete trail with animal tracks and a windmill add to the educational opportunities.



### **Missouri Department of Conservation**

*Jennifer Shackelford (naturalist), 701 NE College Drive, St. Joseph, MO 64507, Buchanan County, 816/271-3100, <[shackj@mail.conservation.state.mo.us](mailto:shackj@mail.conservation.state.mo.us)>*

Otoe Outdoor Study Area is located on Missouri Western State College property. The site's 12 acres includes an intermittent creek, a fishless pond, stocked ponds, successional immature woods, mature riparian woods and reestablished prairie on loess soils, including a well-developed interpretive trail complete with published guide, amphitheater, aquatic plant nursery pond and background research papers.



### **Moberly Middle School**

*Carl Brown (Principal), 920 Kwix Road, Moberly, MO 65270, Randolph County, 660/269-8800, <[cbrown@moberly.k12.mo.us](mailto:cbrown@moberly.k12.mo.us)>*

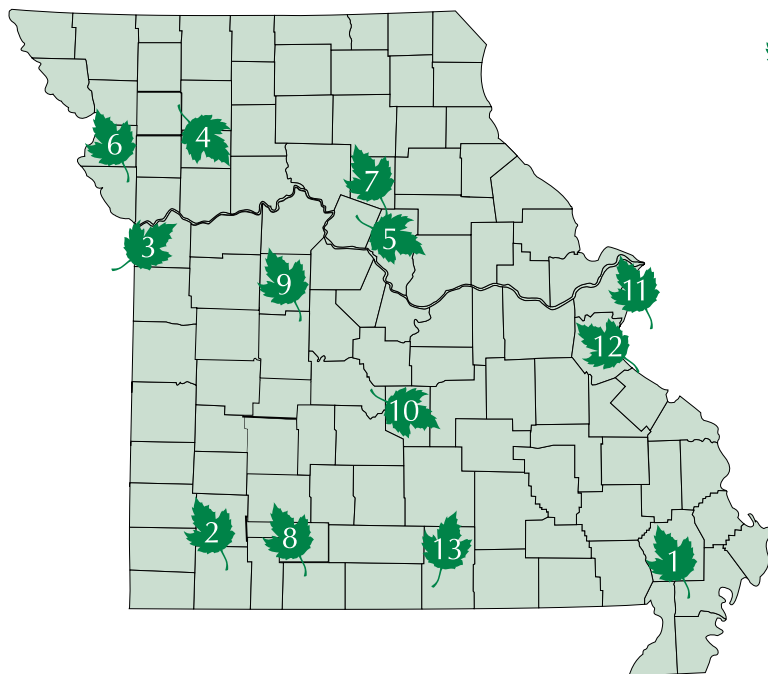
Features a 1- 1/8 mile wood chip trail complete with several student-made bridges, a tree identification area, vegetable gardens and a butterfly garden. Recently, students designed and built an outdoor stage with seating for 60. A wildlife brush pile was created as a result of clearing the amphitheater area. Students are currently developing a prairie grass plot.



### **Nixa Inman Elementary School**

*Terri Crouse (6th grade), 205 North Street, Nixa, MO 65714, Christian County, 417/725-7460, <[tcrouse@mail.nixa.k12.mo.us](mailto:tcrouse@mail.nixa.k12.mo.us)>*

When this school was constructed on a 60-acre site, the administration had the foresight to leave a shallow pond as the beginning of the outdoor classroom. An amphitheater sits under large hickory trees and students



have both vegetable and flower gardens. Physical Education students utilize the outdoor classroom by running a track/trail around its outer perimeter.

### 9 Parkview Elementary

Larry O'Neil (Principal), 1901 South New York, Sedalia, MO 65301, Pettis County, 660/826-4947, <loneil@sedalia.k12.mo.us>

The Prairie Queen Trail features a half-acre pond stocked with catfish, large mouth bass and bluegill, windrow tree plantings, a shelterhouse, amphitheater and developing prairie grass area. Each spring, fifth graders are paired with first graders during a field day that utilizes different learning stations and fishing in the pond.

### 10 Pershing Elementary

Paula Cox (K-5 Art), 7077 Indiana Avenue, Fort Leonard Wood, MO 65473, Pulaski County, 573/329-4081, <pcox@waynesville.k12.mo.us>

A number of different stations (including vegetable and flower gardens, prairie, erosion, butterfly garden, compost, tree ID, decomposition and a fossil dig area) allow multiple classes to use this outdoor classroom at the same time without any disturbance. A written curriculum integrates the outdoor classroom into Pershing's existing education goals for all grades and subjects. Visiting schools and organizations are encouraged to utilize this site Monday-Friday during the day by reservation.

### 11 Pierre Laclède Elementary School

Pauline Humphrey (retired 4th grade) and Eunice Spratt (2nd grade), 5821 Kennerly Avenue, St. Louis, MO 63112, 314/385-0546

Excellent example of an urban outdoor classroom. An active member of the neighborhood, Pauline Humphrey, managed to get the City of St. Louis to tear down three vacant houses near the school. The Moffit Cabbage Patch was born with the help of the community, and now includes a water source, endless raised beds of flowers and vegetables and plans for a future pavilion.

### 12 Rockport Heights Elementary School

Debi Zavadil (Physical and Outdoor Education Teacher), 3871 Jeffco Blvd, Arnold MO 63010-4231, Jefferson County, 636/464-2010

Features a half-mile trail through forest and fields in varying stages of succession, active grass and forb plantings, demonstration food plots, a wetland area with an observation pier, several learning and student activity areas including pavilion and an amphitheater and areas equipped with tables and benches. Teachers from anywhere in the world can visit this outdoor classroom on-line at the website listed below.

### 13 Willow Springs School District

Cay Carter (9-12 Biology), 4th and Ferguson, Willow Springs, MO 65793, Howell County, 417/469-3211 ext. 327.

Used and developed by teachers and students of the elementary school, middle school and high school. Contains the headwaters for the Eleven Point River and a succession plot started by students. This outdoor classroom has been successful at gaining community and school support over the past three years.

## Can't take your own field trip?

Take a Virtual Field Trip: Outdoor Classrooms on the Web

1. Raymondville School District; Raymondville, Missouri  
<[http://rville.k12.mo.us/Outdoor\\_class/index.html](http://rville.k12.mo.us/Outdoor_class/index.html)>
2. Rockport Heights Elementary School; Arnold, Missouri  
<<http://www.fox.k12.mo.us/rockport/newpage1.htm>>
3. Jackson Elementary in Norman, Oklahoma  
<<http://www.norman.k12.ok.us/115/outclass.html>>
4. Hooker Oak Elementary in Chico, California  
<<http://www.ecst.csuchico.edu/~bmcnulty/ho/nature%20center/honature.html>>
5. Chimneyrock Elementary in Cordova, Tennessee  
<<http://www.scs.k12.tn.us/SCS/elementary/Chimneyrock/Chimneyrock/Page2.html>>



## Tips From the Field

We asked teachers and Missouri Conservation Department Staff from around the state for advice about starting and maintaining an outdoor classroom. Here are a few of their responses:

Start with what you teach and your goals. Then develop your outdoor classroom around those goals.

*Amy Smith, Regional O&E Supervisor  
West Plains, Missouri*

Do not take on developing an outdoor classroom alone; the projects are easier and more rewarding if many members of the school are involved.

*A.J. Hendershott, Regional O&E Supervisor  
Cape Girardeau, Missouri*

Keep teachers in the district updated even if they are not involved.

*Mary Ann Carr, Willow Springs M.S.  
Willow Springs, Missouri*

Outdoor classrooms offer great service opportunities for Boy Scouts, FFA and other youth groups.

*Tammy Boyt, Neosho M.S.  
Neosho, Missouri*

Mark new trees clearly (we used orange and red ribbons) to prevent them from being mown down by maintenance workers.

*Cheryl Chapman, Central Elementary  
Pierce City, Missouri*

Talk to your Parent Teacher Organization. Get parent and community involvement, donations. Build pride within so that your project won't die on the vine.

*Toby Bottom, Associate Superintendent  
Webb City R-VII  
Webb City, Missouri*

Learn and use the projects (Project Learning Tree, Project WILD, Project WET, Leopold Education Project).

*Melanie Carden-Jessen,  
Conway H.S.  
Conway, Missouri*

Find other teachers that have outdoor specialties and use them to do what they are good at. This invites more teachers with vested interests who will want to bring students outside.

*Daniellia Stark, Ava Elementary  
Ava, Missouri*

We presented our project to our school board. We used students for this presentation. By obtaining their support and getting them excited about the project, it makes it a lot easier to go back and ask for funds or materials.

*Kevin Cooper, Principal  
Harry S. Truman Elementary  
Webb City, Missouri*

Try to include as many kids as possible. Ownership combats vandalism.

*Vicky Cassady, Webster Primary  
Webb City, Missouri*

Establish a maintenance program early – schedule work-days, arrange summer garden guardians, partner students with senior adults, enlist the assistance of your school's custodian staff.

*Jill Williamson, Harrisburg R-VIII  
Harrisburg, Missouri*

## Awards & Grants

### Charles P. Bell Conservation Scholarships

**Deadline: February 15, 2001**

Elementary, High School and Youth Group scholarships, in the amount of \$250 each, will be awarded to Missouri elementary or high school classes or youth groups who have ongoing or proposed projects related to natural resource conservation, especially those which entail education and physical involvement in the protection of the natural environment. For more information contact [<confedmo@socket.net>](mailto:confedmo@socket.net) or visit [<http://www.confedmo.com/scholars.htm>](http://www.confedmo.com/scholars.htm).



### Captain Planet Foundation Grants

**Deadline: Ongoing**

Funds hands-on environmental projects for children and youth by offering \$250 - \$2500 grants. Visit [<http://www.turner.com/cpf/>](http://www.turner.com/cpf/) for more information and to fill out a grant proposal form.

### Dickerson Park Zoo Environmental Excellence Awards • Deadline: April 6, 2001

Honors individuals and groups that actively support environmental causes through hard work, involvement or financial support. For more information contact Dickerson Park Zoo Environmental Excellence Awards, 3043 North Fort, Springfield, MO 65803, 417/833-1570, [<info@dickersonparkzoo.org>](mailto:info@dickersonparkzoo.org).

### Educators Environmental Excellence Award Program • Deadline: December 31, 2000

The annual Educators Environmental Excellence Award Program is sponsored by Region 7 of the United States Environmental Protection Agency to recognize outstanding environmental educators in the region. Award applications can be obtained by contacting: Office of External Programs, U.S. EPA Region 7, 901 N. 5th Street, Kansas City, Kansas 66101, 913/551-7003, 800/223-0425 or [<http://www.epa.gov/region7>](http://www.epa.gov/region7).

### Grants Program for 7-12 Science and Math Education • Deadline: Ongoing

The Toshiba America Foundation is a private, not-for-profit grant making organization with the mission of improving the quality of grades 7-12 science and mathematics education in U.S. communities by investing in projects designed by and with classroom teachers. The Foundation's total annual grants budget is approximately \$500,000. Teachers should submit a proposal following the specifications found at [<http://www.toshiba.com/about/taf/grant.html>](http://www.toshiba.com/about/taf/grant.html).

### **Human-i-Tees "Make Your World Better" Grant Deadline: March 15**

Provides schools up to \$10,000 for environmental education projects. Request an application by calling 888/875-6698 or apply online at <http://www.cee-ane.org/Grants/mywb.html>.

### **NRA ECHO (Environment, Conservation and Hunting Outreach) Grants**

#### **Deadline: Ongoing**

Sponsored by the National Rifle Association of America, ECHO orchestrates the efforts of businesses, various federal and state government agencies and private groups on scores of projects to advance conservation of wildlife resources. Projects include restoring and enhancing wildlife habitat and conservation education programs. For more information, call NRA Hunter Services at 703/267-1500 or visit <http://www.nrahq.org/shooting/hunting/enviroment.shtml>.

### **President's Environmental Youth Awards**

#### **Deadline: July 31, 2001**

The President's Environmental Youth Awards Program encourages individuals, classrooms, schools, summer camps, public interest groups, and youth organizations to promote local environmental awareness and to channel this awareness into positive community involvement. To be eligible, a young person, or group of young persons, must have completed an environmental project while in grades K-12. To participate in the competition for 2001, projects must be completed by July 31, 2001. Applications are available at <http://www.epa.gov/region07/educat.htm> or by contacting Bill Landis, EPA Region 7, 901 N. Fifth Street, Kansas City, KS 66101, 800/223-0425.

### **2001 SeaWorld/Busch Gardens Environmental Excellence Awards**

#### **Deadline: January 31, 2001**

Recognizes outstanding efforts of K-12 students who work at the grassroots level to protect and preserve the environment. Winners receive monetary awards and an all-expenses-paid trip to Busch Gardens, Tampa Bay (Florida). Projects should offer creative solutions to environmental problems, be primarily student-driven and demonstrate significant environmental and educational impact. For an application visit <http://www.seaworld.org/EEAwards/eea01.htm> or contact SeaWorld/Busch Gardens Environmental Excellence Awards, Education Department, SeaWorld, 7007 SeaWorld Dr., Orlando, FL 32821; 407/363-2389 or 877/792-4332.

### **Small Grants Program for K-6 Science & Math Education Deadline: Fall 2001**

Seventy-five grants for K-6 teachers are available each year (up to \$1000 each) to encourage hands-on teaching of science and mathematics. To request an application, call 212/588-0820 or send a request via email to [foundation@tai.toshiba.com](mailto:foundation@tai.toshiba.com). You may also download the application at <http://www.toshiba.com/about/taf/smallgrants.html>.

### **Toyota TAPESTRY Grants for Teachers**

#### **Deadline: January 18, 2001**

The Toyota TAPESTRY grant program offers grants to K-12 science teachers for innovative projects that enhance science education in the school and/or school district. Fifty one-year grants, totaling up to \$500,000 will be awarded this year. Proposals must describe a project including its potential impacts on students and a budget up to \$10,000. To obtain entry materials: call Fax on Demand service at 888/400-6782 and request document number 591 or visit <http://www.nsta.org/programs/tapestry/index.htm>. Awardees will be honored at the NSTA National Convention in St. Louis on March 22-25, 2001.

## **Brandwein Summer Leadership Institute 2001**

### **Deadline: December 31, 2000**

The Paul F. Brandwein Institute is seeking environmental science teachers who are currently engaged in field-based investigations. Chosen applicants participate in a ten-day all expenses paid summer leadership program in the Pocono Mountains of Pennsylvania. Participants will receive follow-up grants to advance teaching and learning at outdoor laboratories.

Applications are being accepted for the ten-day summer institute that will take place July 19-29, 2001. Twenty of the nation's outstanding teachers will be selected to attend the institute along with field scientists and resource specialists. For more information on the program, visit:

<http://www.brandwein.org/BSLI.html>.

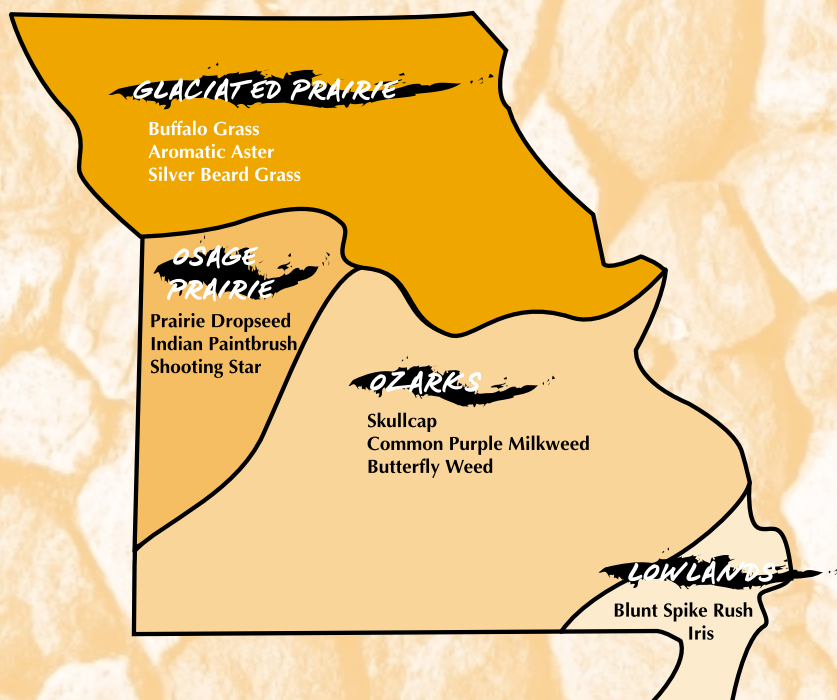
To download an application:

<http://www.brandwein.org/appdwld.html>.

# Show-Me State Garden

When Conservation Education Consultants A. J. Hendershott and Jeff Cantrell developed plans for a garden, they were thinking of home-sweet-home. Their garden, in fact is in the shape of the state of Missouri, making it an excellent addition to any outdoor classroom. Hendershott and Cantrell's state garden plans leave room for creativity and provide an opportunity to teach about Missouri history, insect study, art, journaling, plant science and mathematics within a 15- square-foot area. The garden plans call for a plot in the shape of Missouri, with different plants in each of four natural divisions: glaciated prairie, Osage prairie, the Ozarks and the bootheel lowlands.

Native plant and herb garden versions of the state garden are available. For more information and a complete copy of the state garden plans, contact A.J. Hendershott, 573/290- 5730, <[hendea@mail.conservation.state.mo.us](mailto:hendea@mail.conservation.state.mo.us)> or Jeff Cantrell, 417/451-4158, <[cantrj@mail.conseruation.state.mo.us](mailto:cantrj@mail.conseruation.state.mo.us)>.



## Go Outside and Learn

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about the outdoors to take students outside. Consider acting as a facilitator by guiding students toward asking questions and seeking answers for themselves.

Another common concern is safety. The outdoor classroom can be safe if you take some simple precautions:

- Take time to introduce the activity. At first, you may be better able to hold students' attentions by doing this inside.
- Set physical boundaries for the activity, and make sure your students know what is expected.
- Require students to show the same respect and give the proper care to equipment or materials they are using outside as they would inside during an art assignment or science lab.
- Take precautions for the weather just as when students go to recess or change classes to a modular unit.
- Remove poison ivy and teach your students to recognize and avoid it.

Managing students' behavior, another outdoor classroom concern, need not be a barrier to your outside learning experience. You may even find that "problem" students behave

much better when in the outdoor classroom. Tips for coping with student behavior include the following suggestions:

- Point out to students that going outside to class is no different from walking down the hall to the music room or library.
- Ease your students into going outside by limiting their first outing to a 15 minute excursion. As students become familiar with the new class setting and learn their tasks, you can extend the time frame.
- Consider inviting parent volunteers or older students to help on the days you go outside.

Once these concerns are addressed, there is no limit to how you can use your school grounds for learning. This issue of The Resource is devoted to helping you develop a new or existing outdoor classroom. Take advantage of the resources available, and GO OUTSIDE AND LEARN!





## Project Learning Tree



### School Yard Safari

Help students appreciate the outside world by taking them on a safari of the school grounds. Invite students to look and listen for signs of animals living in or visiting the area. Students may choose to look on the bark and leaves of trees, on shrubs, in the cracks of sidewalks, among blades of grass, on utility wires, in the soil around plants, along the edges of buildings, and on walls and fences. Remind students to look and listen for animal signs as well as actual animals. Ask students to sketch the animals or signs they find and present their findings to the class.



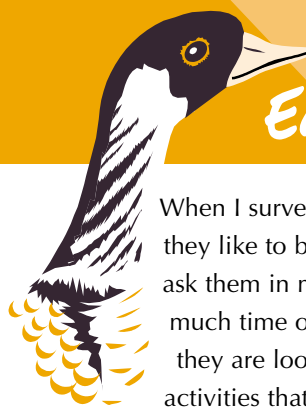
## Project Wild

### Drawing on Nature

Outdoor classrooms are useful in teaching all subject matters. For example, wildlife has been an inspiration for artwork throughout human history. Invite students to practice their drawing skills on items found in the outdoor classroom. Students should sketch or paint an animal by first observing it carefully and then transferring these observations onto paper. Talk with students about the importance of wildlife and nature as a source of inspiration for varying forms of art and science.



For more information on Project WILD and PLT workshops and materials, contact: Bruce Palmer, State Coordinator, Missouri Dept. of Conservation, PO Box 180, Jefferson City, MO 65102-0180, (573) 751-4115 extension 3113, <palmeb@mail.conservancy.state.mo.us>.



## Leopold Education Project

When I survey my college students, most say that they like to be outdoors. However, when you ask them in more detail, they do not spend much time outdoors, and they do not know what they are looking at or understand the daily activities that go on in nature. Why not? The answers may be in the fact that they never really became acquainted with the outdoors.

Taking students outside gives them a chance to become comfortable with the outdoors and willing to learn more about it. Aldo Leopold, in his book *A Sand County Almanac*, talks about becoming aware of our surroundings. He equates native vegetation to a history book and studying a tree to "an autobiography that he who walks with trees may read at will."

"Whoever owns land has thus assumed, whether he knows it or not, the divine functions of creating and destroying plants." Almost all schools have patches of land that are not being used - some small, some large. Leopold states that these "idle spots" can be used to grow plants. Keep the "...mower out of these idle spots, and the full native flora, plus dozens of interesting stowaways from foreign parts, could be part of the normal environment of every citizen." Using these patches can provide great opportunities for students to see native vegetation, attract birds and butterflies, and provide spots for science discovery, art, and creative writing.



For more information on LEP workshops and materials, contact Janice Greene, State Coordinator, Biology Dept., Southwest Missouri State University, 901 S. National Ave., Springfield, MO 65804, 417/836-5306 or at <JaniceGreene@mail.smsu.edu>

### Paper Facts

Environment Recycled Paper is made from Over 75% recycled paper including 25% post consumer fibre.



# The Library

## Conservation and Environmental Education Resources

Want to learn more about outdoor classrooms? A wealth of information awaits you in the following publications and websites.

## WEB RESOURCES

### **Center for Environmental Education of the Antioch New England Institute**

[<http://www.cee-ane.org/>](http://www.cee-ane.org/)

Resource center for many topics including outdoor classrooms. Features an entire page of funding opportunities.

### **Classroom FeederWatch**

[<http://birds.cornell.edu/cfw/>](http://birds.cornell.edu/cfw/)

Data-collecting program that introduces students to scientific research. Designed as a middle school curriculum, Classroom FeederWatch students identify & count birds that visit feeders, use the Internet to share data with scientists and analyze data to answer their own questions.

### **Missouri Department of Conservation Teacher Page**

[<http://www.conservation.state.mo.us/teacher/>](http://www.conservation.state.mo.us/teacher/)

Includes a section on Outdoor Classrooms with information about butterfly gardening, native plants, woodworking for wildlife and much more. Use the "Special Topics" bar to locate information on various topics including birds, insects, endangered species and wetlands.

### **Monarch Watch**

[<http://www.monarchwatch.org/>](http://www.monarchwatch.org/)

All the information needed to set up and maintain a Monarch butterfly observation garden. Includes monarch curricula sources for your outdoor classroom.

### **Outdoor Classroom Resources**

[<http://doe.state.in.us/swcd/odcinfo.htm>](http://doe.state.in.us/swcd/odcinfo.htm)

Ideas for outdoor classrooms. Includes three illustrated plans, a video and links to other websites.

### **School Gardens**

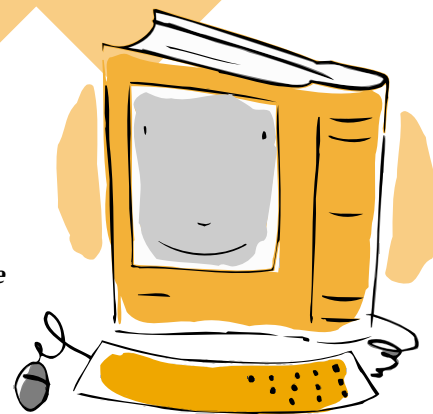
[<http://aggie-horticulture.tamu.edu/kindergarten/Child/school/sgintro.htm>](http://aggie-horticulture.tamu.edu/kindergarten/Child/school/sgintro.htm)

Provides a good introduction to school gardening. Categories include a step-by-step guide to building a school garden, ideas for themes and curricula and ways to incorporate nutrition education into gardening. Includes an outline of weekly gardening lesson plans.

### **Schoolyard Habitats**

[<http://www.nwf.org/habitats/schoolyard/>](http://www.nwf.org/habitats/schoolyard/)

Step-by-step instructions to create your own schoolyard habitat. The National Wildlife Federation recognizes the efforts of schools across the country by certifying those that provide essential habitat for wildlife and integrate the use of their sites as teaching tools for the curriculum.



### **SNAP - School Nature Area Project**

[<http://www.stolaf.edu/other/snap/>](http://www.stolaf.edu/other/snap/)

Successful program in Minnesota that strives to work as a partner with schools and communities, using local nature areas to further environmental education through grants, training and resource support. Many resources available including a downloadable publication entitled *Planning Trails with Wildlife in Mind, A Handbook for Trail Planners*.

## PUBLICATIONS

### **Beyond the Classroom: Exploration of Schoolground and Backyard**

Roth, Cervoni, Wellnitz, Arms. Collection of thirty-three field trips that do not require special equipment or buses. Includes a review of process skills learned during each 15-40 minute experience. Grades K-6. \$12.95. Acorn Naturalists, 17821 East 17th Street, Suite 103, Tustin, CA 92781-2423, phone: (800)422-8886, Fax (800)452-2802, [<http://acornnaturalists.com>](http://acornnaturalists.com).

### **Education Goes Outdoors**

Johns, Liske, Evans. Easy-to-use book for the busy teacher. Utilizes easily accessible natural resources to integrate science with math, language arts, social studies and the arts. Grades K-9. \$17.95. Acorn Naturalists, 17821 East 17th Street, Suite 103, Tustin, CA 92781-2423, phone: (800)422-8886, Fax (800)452-2802, [<http://acornnaturalists.com>](http://acornnaturalists.com).

### **The Geography of Childhood: Why Children Need Wild Places**

Gary Paul Nabhan and Stephen Trimble. Boston: Beacon Press, 1994. Investigation of how children come to care deeply about the natural world. The authors ask searching questions about what may happen to children denied exposure to wild places--a reality for more children today than at any time in human history. To order, contact your local or online bookstore.

### **Just Beyond the Classroom: Community Adventures for Interdisciplinary Learning**

Knapp. Allows teachers to turn any outdoor experience into meaningful lessons in science, math, social studies and fine arts. \$11.95. Acorn Naturalists, 17821 East 17th Street, Suite 103, Tustin, CA 92781-2423, phone: (800)422-8886, Fax (800)452-2802, [<http://acornnaturalists.com>](http://acornnaturalists.com).



***Ten-Minute Field Trips: A Teacher's Guide to Using the Schoolgrounds for Environmental Studies***

Russell. Amazing science activities that are found just outside your door. School yard biology is used to develop key science process skills. Grades 3-6. \$19.95. Acorn Naturalists, 17821 East 17th Street, Suite 103, Tustin, CA 92781-2423, phone: (800)422-8886, Fax (800)452-2802, <<http://acornnaturalists.com>>.

***WILD School Sites: A Guide to Preparing for Habitat Improvement Projects on School Grounds***

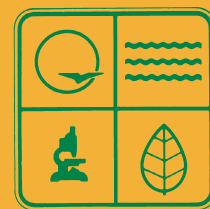
Helps students and teachers learn about the importance of biodiversity, understand the basic steps of creating a wildlife habitat, develop a plan for action and gain community support. The goal of this guide is to assist educators and their students in taking responsible action to improve their communities for people and wildlife--beginning on their school grounds. \$5.00 plus S&H. Project WILD, 707 Conservation Lane, Suite 305, Gaithersburg, Maryland 20878, phone: (301) 527-8900, Fax (301) 527-8912, <<http://www.projectwild.org>>.

***Greening School Grounds: Creating Habitats for Learning***

NEW!! In mid-December, Green Teacher magazine is publishing *Greening School Grounds: Creating Habitats for Learning*. The 50 articles and activities in this large-size 120-page paperback offer teachers and parents step-by-step instructions for creating numerous schoolyard projects including ponds, tree nurseries and butterfly and vegetable gardens. Extensive curricular suggestions and lists of funders, teacher-training organizations and teaching resources are provided. \$14.95. Green Teacher, P.O. Box 1431, Lewiston, NY 14092, (416)960-1244, <<http://www.greenteacher.com>>.



# Natural Resources Education



Department of  
Natural Resources

## SHOW ME OUTDOOR CLASSROOMS:

### Missouri's State Parks Are Waiting For You!

by James D. Lubbers, Environmental Education Specialist  
Missouri Department of Natural Resources

Once upon a time, the outdoors was the classroom. The Nature Study movement in the late 1800s provided the basis for much of the science curriculum of the day. Backing up even further, more than two millennia ago, *natural philosophy* was made popular among Aristotle and his cohorts. Today, except for having a scratched surface, the natural world (what's left of it) has not really changed all that much, and scientists are still finding new things in the rainforest, in deep space, at the bottom of the oceans and in our own chromosomes.

Missouri is blessed with a wonderful variety of natural environments and unique features that serve as the ultimate in outdoor classrooms for millions of visitors every year—our state park system. The Missouri Department of Natural Resources, Division of State Parks (DSP) administers the system, which includes 80 state parks and historic sites. These parks and sites preserve and interpret the state's most outstanding natural and cultural features while providing a backdrop for many types of recreation.

Taking your students on a field trip to any of the parks or historic sites is certainly a worthwhile endeavor. Information about the parks and historic sites can be obtained through the DSP web site, <[www.mostateparks.com](http://www.mostateparks.com)> or by calling 800-334-6946. Call a park or historic site directly to arrange a visit. Be sure to plan ahead with pre- and post- field trip lessons and perhaps alternating activities at the site to help the park staff accommodate large groups.

If your field trip options are limited, as is often the case, an outdoor classroom or natural area near your school can provide many valuable opportunities for learning. Many schools already use such sites, and visiting some of them could be all you need to get started developing your own outdoor classroom.

# EECalendar

## December 6

### Winter Ecology: What About Winter?

Missouri Botanical Garden, St. Louis  
9:00 a.m. - 3:00 p.m. Tailored for classroom teachers and non-formal educators who will use their own site, a local park or schoolyard for outdoor winter studies. \$10. Contact: Celeste Prussia at the Litzsinger Road Ecology Center, 314/577-5117.

## December 12

### Winter Investigations for Teachers

Litzsinger Road Ecology Center, Ladue  
9:00 a.m. - 3:00 p.m. Designed to help teachers conduct activities at Litzsinger Road Ecology Center, their school or a local park. Apply for substitute release funding and assistance with transportation for winter ecology studies scheduled at the LREC. \$10. Contact: Celeste Prussia, 314/577-5117.

## January 8-12

### Incorporating MO Birds into the Curriculum

SMSU, Springfield  
Hands-on, cross curricular activities for the classroom. Be prepared to go outside if the weather is permissible. 1 hour credit, Southwest Missouri State University. Contact: Jeff Cantrell, 417/781-2811 or 417/451-4158 for class information or Mary Ann Claypool, 417/836-5073 for registration.

## January 13-14

### Kit and Curriculum: Waste Reduction Education

Jefferson City  
Introduction to two new initiatives in solid waste education: a 23-lesson activity guide and "travelin' trash" kits, both developed through the Missouri Department of Natural Resources. The materials are targeted for grades 4-8, but include resources for other levels. Also explore the waste tire issue, including a field trip to the University of Missouri's power plant where waste tires are mixed with coal

to fuel the plant. 1 hour graduate credit, Lincoln University (\$60). \$30 registration fee. Contact: Joe Pitts or Jim Lubbers at 800/361-4827 or 573/526-6627.

## January 20 and February 3

### Studying Animal Behavior

Saint Louis Zoo, St. Louis  
9:00 a.m. - 4:00 p.m. Gain the background information and experience needed to teach an animal behavior investigation unit at the Zoo and in your classroom or neighborhood. Zoo staff will discuss methods that work and pitfalls to avoid in completing a successful animal behavior study. Meet with research staff to learn about current behavioral studies and techniques used here at the Zoo. \$30. 1 hour graduate credit, Lindenwood University. Contact: Saint Louis Zoo, 314/768-5466.

## February 10-11

### Watershed as an Organizing Concept

Jefferson City  
Provides teachers with a clear understanding of "watershed" as a framework for learning about water quality and quantity, managing water resources and for making responsible decisions regarding water resource issues. 1 hour graduate credit, Lincoln University (\$60). \$30 registration fee. Contact: Joe Pitts or Jim Lubbers at 800/361-4827 or 573/526-6627.

## February 17

### Spineless Wonders

Saint Louis Zoo, St. Louis  
9:00 a.m. - 4:00 p.m. Teachers of grades K-3. Bring the wonder of invertebrates to life for your students. We will also provide information about maintaining animals in your classroom. "Bug" your co-workers to take this workshop with you. \$15. Contact: Saint Louis Zoo, 314/768-5466.



Missouri's winter eagle watching is spectacular. Come enjoy live eagle presentations, exhibits, activities, spotting scopes and refreshments. For more information contact Nickie Phillips (573) 751-4115 x3289 or visit <http://www.conservation.state.mo.us/events/eagledays/>.

## December 2-3

Squaw Creek National Wildlife Refuge, Mound City  
9:00 am to 4:00 pm

## January 6

Willmore Lodge, Lake Ozark  
9:00 am to 4:00 pm

## January 13

Jerry Litton Visitor Center, Smithville Lake, Smithville  
9:00 am to 3:00 pm

## January 20-21

Old Chain of Rocks Bridge, St. Louis  
9:00 am to 3:00 pm

## January 20-21

Springfield Conservation Nature Center, Springfield  
9:00 am to 4:00 pm

## January 27-28

Lock and Dam 24 and Apple Shed Theater, Clarksville  
9:00 am to 5:00 pm

## February 3-4

Mingo National Wildlife Refuge and Duck Creek Conservation Area, Puxico  
9:00 am to 4:00 pm

# Why Landscape with Native Plants?

*By Cheryl Riley, Co-Coordinator of the Grow Native! Program and Dave Tylka, Technical Advisor to the Grow Native! Program*

Choosing to buy and grow native plants – whether in outdoor classrooms or your own backyard – makes a lot of sense. Planting native species in urban, suburban and rural landscapes can benefit our local environment and teach students about Missouri's rich natural heritage. Native plants are:

- a source of food and cover for wildlife, such as songbirds, butterflies, turtles, frogs and toads.
- adapted to this region's temperatures, soil conditions and rainfall and can better survive the stresses of hot weather and droughts without a lot of care.
- threatened by growing urbanization. Using native species may save some plants from extinction.
- an alternative to potentially destructive exotics. Millions of dollars of taxpayers' monies are spent annually on control of these exotics.

Native plants in your outdoor classroom also become a history lesson! The vast prairies and virgin forests of Missouri have all but disappeared from our landscape. These natural communities are an integral part of Missouri's history and natural heritage. Native American Indians taught white settlers how to ease toothaches with coneflower roots. Lewis and Clark docu-

mented in their journals the plants they found on their journey up the Missouri River and back to St. Louis. Mighty oaks fueled riverboats and supported railroad lines that united east and west. Spicebush berries flavored pioneer dinners, and horsetail stalks were used as early scouring pads after dinner. Businesses were founded on the extract from sassafras trees. Where would baseball be without bats carved from ash trees? Planting native species helps students learn about this rich heritage.



Are you interested in a unique fundraiser for your school? Tired of ordering candy, popcorn and wrapping paper? What about selling native plant collections that add to Missouri's natural heritage as well as raise money for your school projects? For more information, call Judy Allmon at 573-782-4059 or Cheryl Riley at 573-893-8100.

Depending on the type of environment you have — sunny or shady, you can enjoy a wide variety of native Missouri plants. The Grow Native! Program encourages growing, selling and using Missouri native seeds, plants, shrubs, vines and trees to provide more natural landscape for the enjoyment of people and the benefit of wildlife. It is sponsored by the Missouri Department of Conservation in cooperation with Missouri nurseries, garden centers and related businesses.

To obtain a list of nurseries participating in the Grow Native! Program and an informative brochure, send a self-addressed, 55-cent stamped envelope to Grow Native!, P.O. Box 104671, Jefferson City, MO 65110.

## 4th Annual Missouri Envirothon

Are you looking for a way to motivate your students or youth group to learn about the environment? Envirothon involves regional and statewide competitions for teams of young people. Teams rotate through challenge stations where they complete environmental performance tasks. The state's winning team will travel to Nationals in Raymond, Mississippi to compete with teams from other states. Contact Peggy Lemons, Missouri Association of Soil and Water Conservation Districts, 573/893-5188 for more information.

### State Envirothon:

May 3 at the Runge Nature Center  
Jefferson City

### Regional Envirothon Competitions:

- **Southeast Region**, Cape Girardeau area, early April, contact: Carol Barnes, 573/333-0751 ext.3.
- **St. Louis Region**, Busch Wildlife, April 19, contact: Sarah Aldridge, 636/922-2833 ext.3.
- **Northwest Region**, MDC Regional Office, St. Joseph, April 24, contact: Bill White, 816/232-6555 ext.6.
- **Central Region**, local farm, Columbia (tentative), April 25, contact: Caroline Todd, 573/446-9091 ext. 3.
- **Southwest Region**, Springfield Conservation Nature Center, April 25, contact: Kathryn Braden/Cindy Dalton, 417/546-2089.
- **Kansas City Region**, Blue Springs, Burr Oaks, April 26, contact: Bill Bohnert, 816/228-1161 ext.3.





# EDUCATION CONSULTANT DIRECTORY

Conservation education consultants are available to provide consultative services and to offer courses and workshops in conservation education. Addresses, phone numbers and e-mail addresses are for teacher or youth leader use only.

## 1 Vacant

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N.W. Region  
701 NE College Drive  
St Joseph MO 64507  
(816)271-3100

## 2 Joe Ryan

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## 10 Steve Shupe

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cantrj@mail.conservaion.state.mo.us

## 12 Jean Mayer

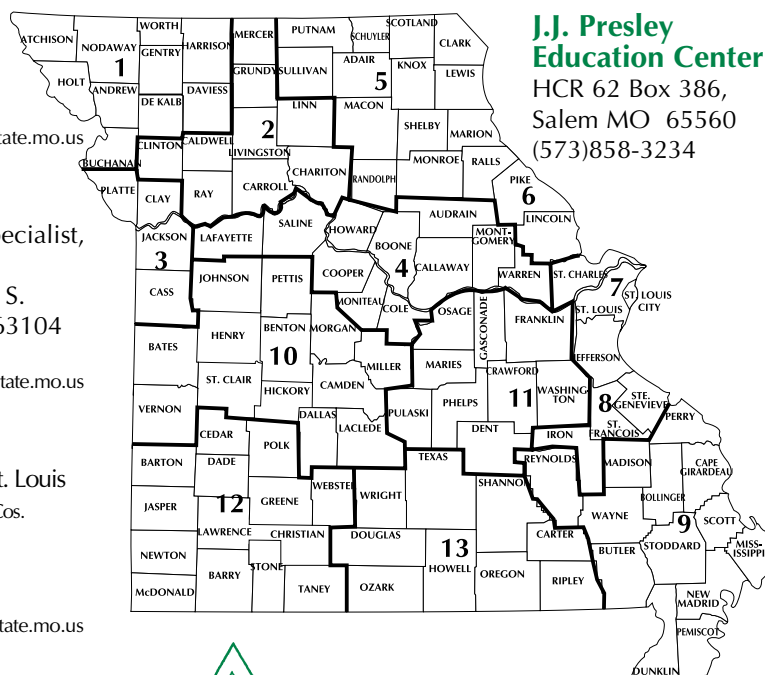
Outdoor Skills Ed. Specialist,  
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(417)895-6880, x1036  
mayerj@mail.conservaion.state.mo.us

## 13 Vacant

Education Consultant,  
Ozark Region  
Ozark Regional Office  
618 Preacher Roe Blvd.  
P.O. Box 138  
West Plains MO 65775  
(417)256-7161

## J.J. Presley Education Center

HCR 62 Box 386,  
Salem MO 65560  
(573)858-3234



Outreach and Education Division  
Missouri Department of Conservation  
P.O. Box 180, Jefferson City MO  
65102-0180  
(573)751-4115



# Conservation Curriculum

## LEARNING IN THE GREAT OUTDOORS

Students learn best when presented with authentic and meaningful experiences. An outdoor classroom offers one way to provide students with an abundance of unique learning experiences. Outdoor classrooms may be as simple as a patch of unmowed ground in the corner of a school campus or as complex as several acres of woodlands, pond and prairie. This month's "Curriculum Insert" identifies several resources available to teachers interested in developing outdoor classroom programs. Three activities are included that can be easily conducted in an outdoor setting.

### OUTDOOR CLASSROOM RESOURCES

#### Planning an Outdoor Classroom

You may request a copy of *A Guide to the Planning and Development of Outdoor Classrooms* from the Missouri Department of Conservation. This guide is designed to assist teachers, administrators and other persons interested in the establishment of outdoor classrooms on school grounds. Write to: Distribution Center, Missouri Department of Conservation, P.O. Box 180, Jefferson City, MO 65102-0180.

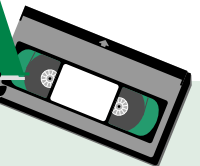


#### Woodworking For Wildlife

This classic MDC publication contains full instructions and diagrams for building a wide variety of bird feeders and nesting boxes. You'll find plans for more than a dozen woodworking projects including bird feeders, bird houses, a squirrel den and a bat house. *Woodworking for Wildlife* is an essential publication for all outdoor classrooms. The plans provide short-term projects for students, scout groups and 4-H students, as well as for anyone with a basic toolbox. Assembled and installed correctly, these wildlife feeders and houses bring great wildlife viewing satisfaction for everyone involved!

To receive your free copy of *Woodworking for Wildlife* write to: Distribution Center, Missouri Department of Conservation, P.O. Box 180, Jefferson City, MO 65102-0180 or find it on the internet at <http://www.conservation.state.mo.us/nathis/woodwork/>.

## MEDIA loan list



You may borrow the following items by contacting our Media Librarian at 573/751-4115 x3837, fax at 573/751-2260 or writing to: Media Librarian, Missouri Department of Conservation, PO Box 180, Jefferson City, MO 65102-0180.

#### Using an Outdoor Classroom

High School-Adult/ 10 minute video

See how teachers use the outdoors as special "classrooms" in both urban and suburban/rural settings. It's a multidisciplinary approach to teaching with nature.

#### Missouri Outdoors: Outdoor Education/Kids and Conservation I, II, and III

These three videos offer collections of stories that deal with Outdoor Education.

Included are stories on Outdoor Classroom/Teachers' Camp, St. Peters Outdoor Classroom, Sedalia's Outdoor Classroom, K.C. Urban Youth Corp and more.

# Ecology Bingo



PreK-4

*This activity offers elementary students an introduction to outdoor classrooms. Students are prompted to observe their surroundings by a scavenger hunt-like game of Ecology Bingo.*

## Objectives:

After completing this activity, students will be able to:

1. Apply observation skills to identify several common natural objects. [1.3, 1.6, 4.6, SC3]
2. Sketch or write a brief description of selected natural objects and basic ecological terms such as **producer**, **consumer**, **decomposition** and **erosion**. [2.1, CA4, FA1, SC3]
3. Locate and understand the potential hazards of an outdoor setting (i.e. poison ivy, thorns). [4.7, HP5]

**Materials:** copy page; pencils, paper and writing surface (e.g., cardboard squares)

## Procedure:

1. Review Safety Precautions before entering the outdoor classroom.
2. Have students work individually or in teams to find as

many items on the Bingo list as possible. Younger students will likely need additional help. **Invite their parents to participate and help.** (High school students may also be invited to help the very young.)

3. Students should circle each item that they observe in the outdoor classroom. Have students sketch or describe each item that they circle.
4. Following the activity, have students share their findings with the class.

## Extensions:

1. Older students can make their own bingo cards by creating clues for items found in the outdoor classroom. Students can trade cards and use the new clues to sketch or describe additional items.
2. For younger students, gather objects such as flowers, leaves and nuts. Have students categorize the natural objects by shape, color or texture.

## Identifying Poison Ivy

Poison Ivy is a woody shrub or vine. All parts of poison ivy, including the roots, are poisonous at all times of the year. It is often confused with other plants, most often with the harmless fragrant sumac. Here are the key differences to distinguish poison ivy from fragrant sumac:

### Poison Ivy

- three divided leaves, unevenly notched
- center leaflet on longer stalk
- white, waxy berries along the stem

### Fragrant Sumac

- three divided leaves, evenly lobed
- center leaflet not on a stalk
- red, fuzzy berries at the end of stem



## Safety Precautions:

- Watch for poison ivy—If you come into contact with poison ivy, wash the area with soap and water as soon as possible to remove the plant's oils from your skin.
- Guard against ticks by tucking pantlegs in socks or boots or by wearing a repellent—Should you find a tick fastened, remove it immediately, with a pair of tweezers if possible. Be careful to remove all mouth parts. Treat the bite with an antiseptic.

## Outdoor Ethics:

- Don't pick flowers
- Don't disturb nests
- If you pick up an object, return it to its original location
  - Do not collect anything not asked for on the "Ecology Bingo" copy sheet.

## Animal Characteristics

### Mammals:

- hair
- live births
- warm-blooded

### Birds:

- feathers
- lay eggs
- warm-blooded

### Insects:

- 6 legs
- 3 body segments
- exoskeleton

## Producer or Consumer?

### Producers

- Make their own food
- Example: green plants

### Consumers

- Must eat other plants and/or animals
- Examples: birds, insects, humans





# Ecology Bingo

## Directions:

Circle those items that you are able to observe in the outdoor classroom.

Sketch or describe each item. If you can, identify each item by name.

<b>Poison Ivy or Thorn</b> (look but don't touch)	<b>Something Decomposing</b> (rotting)	<b>An Animal Sound</b> (who do you think made that sound?)	<b>A Producer</b>
<b>A Consumer</b>	<b>The Source of Energy for Life</b> (hint: don't look directly at this)	<b>Something Yellow</b>	<b>A Piece of Litter</b> (take this back to class for disposal)
<b>An Animal Sign</b> (holes in leaf, animal tracks, spider web, etc.)	<b>Something Soft</b>	<b>Warm-Blooded Animal with Feathers</b> (Bird)	<b>A Seed</b> (how did it get here?)
<b>Something Red</b>	<b>Warm Blooded Animal with Fur or Hair</b> (mammal)	<b>Soil Erosion</b>	<b>An Insect on a Leaf or Flower</b>

13-16 CORRECT .....YOU ARE AN ECOLOGY WIZARD  
 9-12 CORRECT .....YOU ARE A STAR ECOLOGIST  
 5-8 CORRECT .....YOU ARE A BUDDING ECOLOGIST  
 1-4 CORRECT .....YOU ARE AN ECOLOGY HOPEFUL  
 0 CORRECT .....GUESS YOU STAYED HOME TODAY!

## Can They Live Here?

*This lesson is related to "Snips and Snags" in the November issue of Outside In. Students research the habitat needs of several species and determine if they are found in their outdoor classroom. Students then develop and carry out a management plan to attract missing species.*

### Objectives:

After completing the activity, students should be able to:

1. Research and describe the habitat needs for a specific selection of wildlife species. [1.2, 1.4, CA4, SC3]
2. Evaluate the habitat quality of these species in their outdoor classroom. [1.3, SC4]
3. Develop a management plan to improve the outdoor classroom wildlife habitat. [1.10, 3.2, 3.3, 4.6, SC8]
4. Present plans to the class using visual aids. [1.8, 2.1, 4.1, CA1, CA6, FA1]
5. Select and implement a management plan. [1.5, 3.8, CA5]

### Materials:

paper, pencils, writing surface, student copy page, access to research materials

### Background:

A **habitat** can be defined as the environment or place in which the life needs—food, water and protective cover—of an organism, population or community are supplied. Ask students to describe the habitat needs for a well-known wildlife species such as the bald eagle. (A river or other large body of water where fish and trees for perching are available.) People have the same habitat needs of food, water and protective cover. What might happen to a wildlife species if any one of the three "elements" of its habitat were to disappear? The species would either have to find a new place or perish.

### Procedure:

1. Have students read "Snips and Snags" in the November issue of *Outside In*.
2. Tell students that they are going to research the habitat needs of **five** Missouri wildlife species (from a list of fifteen species) and then inspect their outdoor classroom to determine if it provides the habitat needs for those species.
3. Provide each student with a copy sheet. You may wish to have the students work individually or in

groups. Ask them to select five wildlife species from the list and add the names of these species to their charts. Review the kind of information that they need to record for each species (preferred foods, sources of water and preferred protective cover).

4. Following their research, conduct an outdoor classroom inspection and have students record their findings in the last two columns of the chart.
5. In groups of 3-4 have students develop a management strategy to attract missing species. Plans should be feasible, as the winning team may have their plan incorporated in the outdoor classroom.
6. Have teams present their management plans. Each presentation must include some kind of visual aid (power point, diorama, poster, mural, cartoon strips, etc.).
7. After all teams have made their presentations, have students (or a panel of faculty and parents) vote for a management plan that could be conducted in your outdoor classroom.
8. Discuss the winning team's plan as a class and make any necessary modifications. Have the class implement the plan and monitor the area for signs of increased wildlife use.



Tell us about your management plan! Describe your class' winning plan and how it was implemented into your outdoor classroom. What changes in wildlife composition have occurred because of your plan? Send your results to: *The Resource*, Missouri Department of Conservation, Education Programs, P.O. Box 180, Jefferson City, MO 65102-0180.

# Can they live here?

I. Select **five** Missouri animals from the list that follows. Research the habitat preferences for each species and note this information on the chart below. Inspect your outdoor classroom to determine if each species' habitat needs are satisfied here. If not, suggest improvements to the outdoor classroom that would attract them to the area.



Woodpecker	Fox or Gray Squirrel	Flying Squirrel	Salamander	Toad	
Black-Capped Chickadee	Raccoon	Butterfly	Rabbit	Skunk	
Nuthatch	Opossum	Shrew	Honey Bee	Owl	
	Results of Library or Internet Research			Results of Outdoor Classroom Inspection	
Name of Animal	Food Preferences	Source of Water	Protective Cover Preferences	Is There Evidence That the Animal Occurs Here?	If Not, What Could Be Done To Attract The Animal?

- II. In groups of 3-4, develop a management strategy to attract the missing species of your list. Present this strategy to the rest of your class using a visual aid (power point, diorama, poster, mural, cartoon strips, etc.). Be creative, but remember that your project must be feasible!
- III. As a class, vote on the best management plan.
- IV. Implement the selected plan in your outdoor classroom and monitor the area for signs of new animal activity.



# Three Sisters Garden

*In this activity, students research the history, folklore, agriculture and nutrition of a Three Sisters Garden, plant a Three Sisters Garden and present their findings to elementary students.*

## Objectives:

After completing this activity, students will be able to:

1. Conduct research on a specific aspect of the Three Sisters Garden (1.2, 1.4, 1.9, SS5, SS6, CA2, CA4, SC3, HP2)
2. Teach other members of the group about their research topic (1.5, 2.2, CA1, CA6)
3. Design, plant and care for a Three Sisters Garden (2.5, 3.2, 4.6, SC3)
4. Present their findings to elementary students (1.8, 2.1, CA1, CA6)

## Background:

*"In late spring, we plant the corn and beans and squash. They're not just plants - we call them the three sisters. We plant them together, three kinds of seeds in one hole. They want to be together with each other, just as we Indians want to be together with each other. So long as the three sisters are with us we know we will never starve."*

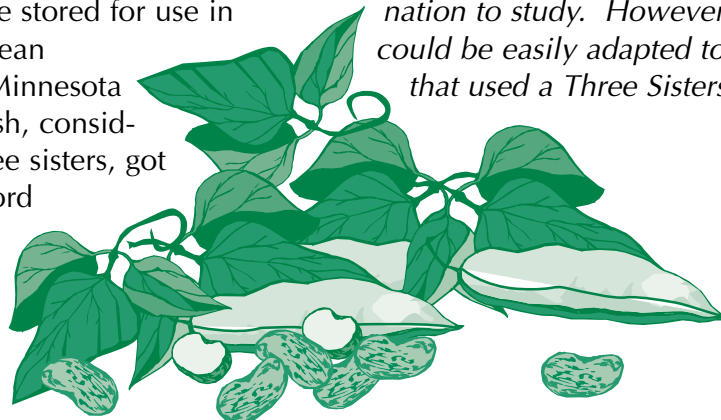
Chief Louis (Onondaga)

The Three Sisters garden is an integral component of several native North American tribes. The concept originated from the Haudenosaunee (pronounced "hah-dee-no-show-nee") tribe, also known as the Iroquois. The Three Sisters are not people; they are the three staple crops of corn, beans and squash. Corn, a sustaining food source to the Native Americans for many centuries, is also known for its wide color variations. Each nation was the caretaker of its own type and color of corn, which was often passed to other nations as gifts. Beans were dried to be stored for use in the winter. The root word of bean among the Hidatsu people of Minnesota is "ama", meaning sister. Squash, considered to be the eldest of the three sisters, got its name from an Algonkian word meaning sister – "askuta."

## Procedure:

1. Using the cooperative learning structure, Jigsaw, divide the class into groups of four.
2. Within each group, number the students 1-4. Have number one's study history, number two's study folklore, number three's study agriculture and number four's study nutrition of the Three Sisters Garden. Each student will become an expert in one of the four areas and report their findings to the group. It is the responsibility of each student to make certain that the other three understand their component thoroughly.
3. As a group, have students design, plant, and care for a Three Sisters Garden.
4. Have students prepare a presentation for elementary students on the impact and importance of the Three Sisters Gardens in Native American history.

*\*The learner expectations of this activity use the Haudenosaunee as the Native American nation to study. However, this lesson could be easily adapted to other nations that used a Three Sisters Garden.*



# Three Sisters Garden

After being divided into groups of four, each person will study a different aspect of the Three Sisters Garden. Individually research your topic and become an expert in your field. You are responsible for teaching the other members of your group about your area of expertise. Then design, plant and care for your own Three Sisters Garden.

## Learner Expectations

### 1. History

- Research the agricultural tools available to the Haudensaunee.
- Describe the environmental resources available to the Haudensaunee tribe.
- Compare the agricultural practices of the Haudensaunee to modern agricultural practices.
- Investigate the reasons the Haudensaunee created the Three Sisters Garden.
- Describe how the Three Sisters Garden spread to other Native American Tribes.
- Work with the agriculture, nutrition and folklore experts to design, plant and care for a Three Sisters garden.

### 2. Folklore

- Describe the religious beliefs of the Haudensaunee.
- Relate the impact of the Three Sisters Garden on the Haudensaunee beliefs.
- Find folklore about the Three Sisters Garden. Pick an example of the folklore to recreate in front of the elementary students.
- Create a new folk tale about the Three Sisters Garden.
- Work with the history, agriculture and nutrition experts to design, plant and care for a Three Sisters garden.

### 3. Agriculture

- Describe the growing season required to produce a Three Sisters Garden.
- Describe regions in North America capable of producing a Three Sisters garden. Include in your descriptions the growing seasons for each region.
- Research the origins of beans, corn, and squash.
- Investigate seed collection methods of the Haudensaunee and compare to modern methods of seed collection.
- Work with the history, nutrition and folklore experts to design, plant and care for a Three Sisters garden.

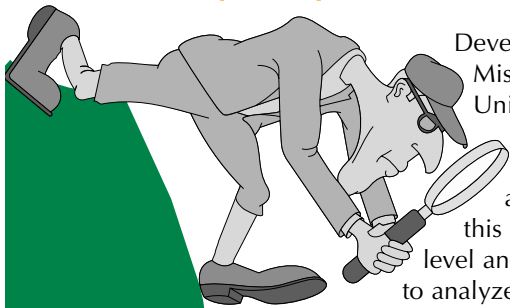
### 4. Nutrition

- Research the diet of the Haudensaunee.
- Find recipes using beans, corn or squash. Compare modern recipes to how the Haudensaunee prepared and used beans, corn and squash.
- Compare the diet of the Haudensaunee to modern diets.
- Define the nutritional contribution of beans, corn and squash.
- Work with the history, agriculture and folklore experts to design, plant and care for a Three Sisters Garden.

After researching individual learner expectations and discussing within your group, prepare a presentation for elementary students. Presentations should include the impact of the Three Sisters Garden on the Haudensaunee culture, folklore and nutrition.



## New Water Quality Curriculum: The Mystery at Hickory Hollow



Developed by Southwest Missouri State University's College of Education and College of Natural and Applied Sciences, this unit invites middle level and high school students to analyze an array of real life documentary evidence provided by the worried citizens of the "make believe" Ozarks town of Hickory Hollow. The drinking water supply appears to be contaminated and Hickory Hollow citizens need help identifying the problem. Free access to on-line Teachers Guide and student booklet with complete directions for implementing the unit are available at <http://www.cnas.smsu.edu/hickoryhollow/>. For more information contact Roberta Aram (417/836-5365) or Georgianna Saunders (417/836-5365).

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## Mission Statement

The Resource is published in October, December, February and April by the Office of Environmental Education. Its purpose is to provide: current information on conservation and environmental education resources and events; suggestions for integrating environmental subjects into teaching; a forum for environmental education discussion and networking in Missouri; and a clearing-house for bringing together environmental education resources and partners.

For a free subscription or to submit information to the newsletter, write to: Office of Environmental Education, Missouri Department of Conservation, P.O. Box 180 Jefferson City, MO 65102-0180.

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